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(54) **CIGARETTE LIGHTER ADAPTER WITH GRIPPING STRUCTURE**

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* cited by examiner

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(57) **ABSTRACT**

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(52) **U.S. Cl.** **439/668**

(58) **Field of Search** 439/138, 668,
439/484; D13/144

A cigarette lighter adapter for an electronic device has an exterior gripping portion featuring a textured surface for gripping by the user and a finger hole for a user's finger to be inserted through to facilitate the insertion and removal of the adapter from a cigarette lighter socket. The exterior gripping portion and the finger hole permit the user to have a secure hold on the adapter without putting any tension on the adapter cord, thereby eliminating the possibility of damage to the cord and to the internal components of the adapter.

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5 Claims, 2 Drawing Sheets

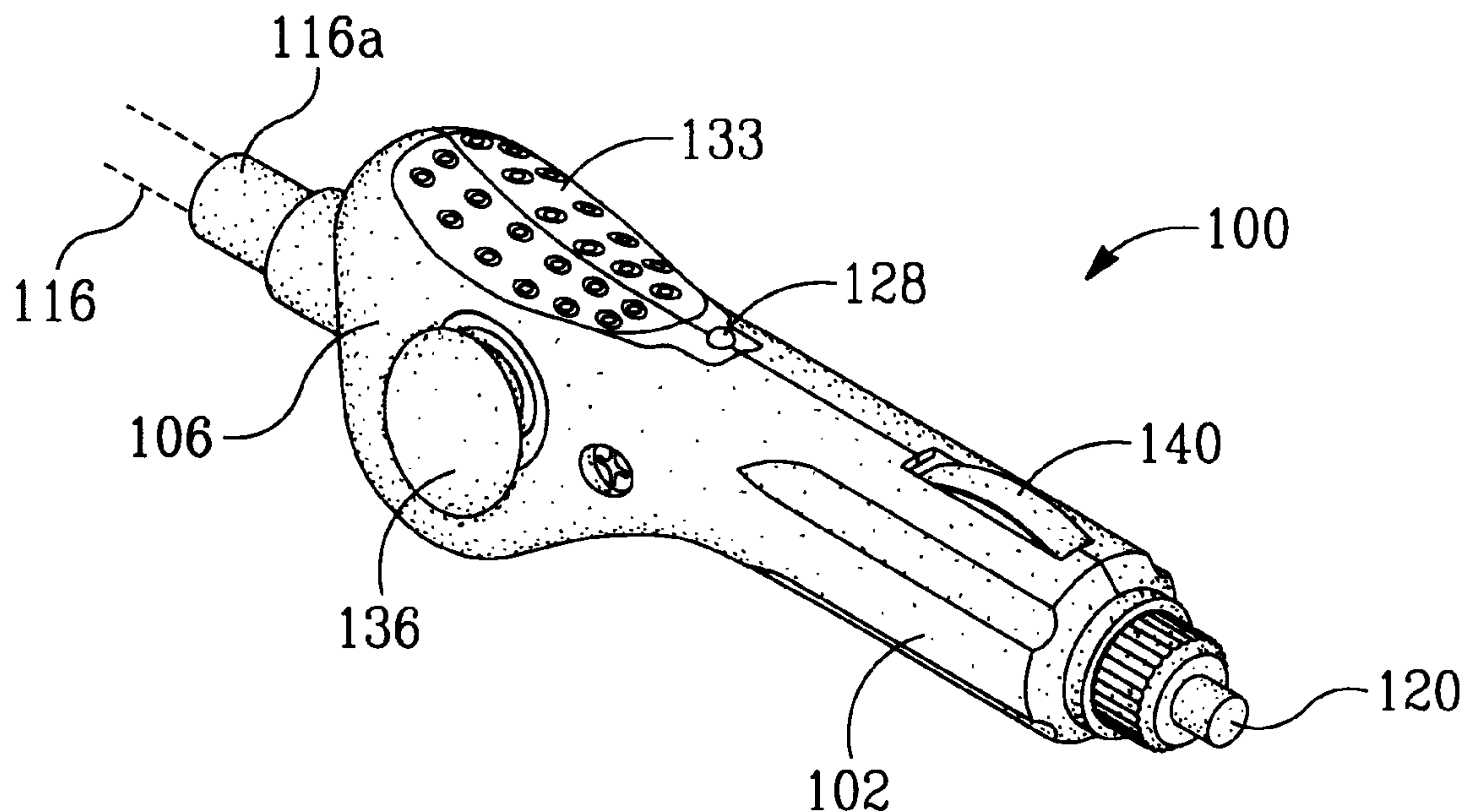


Fig. 1

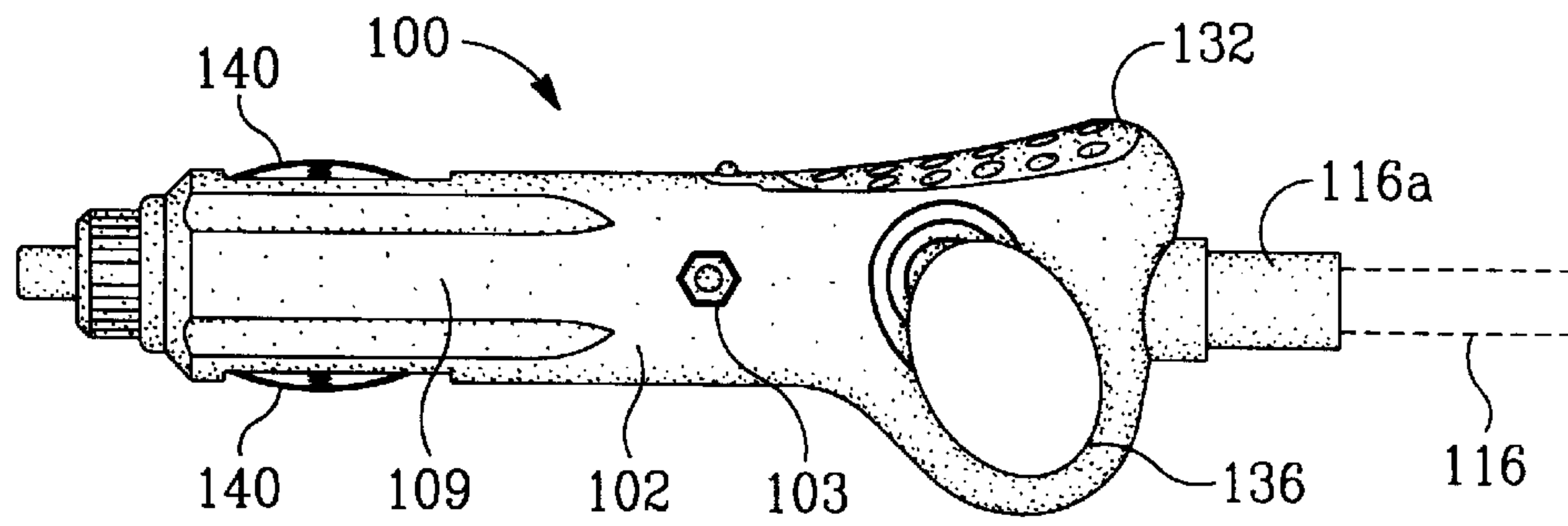


Fig. 2

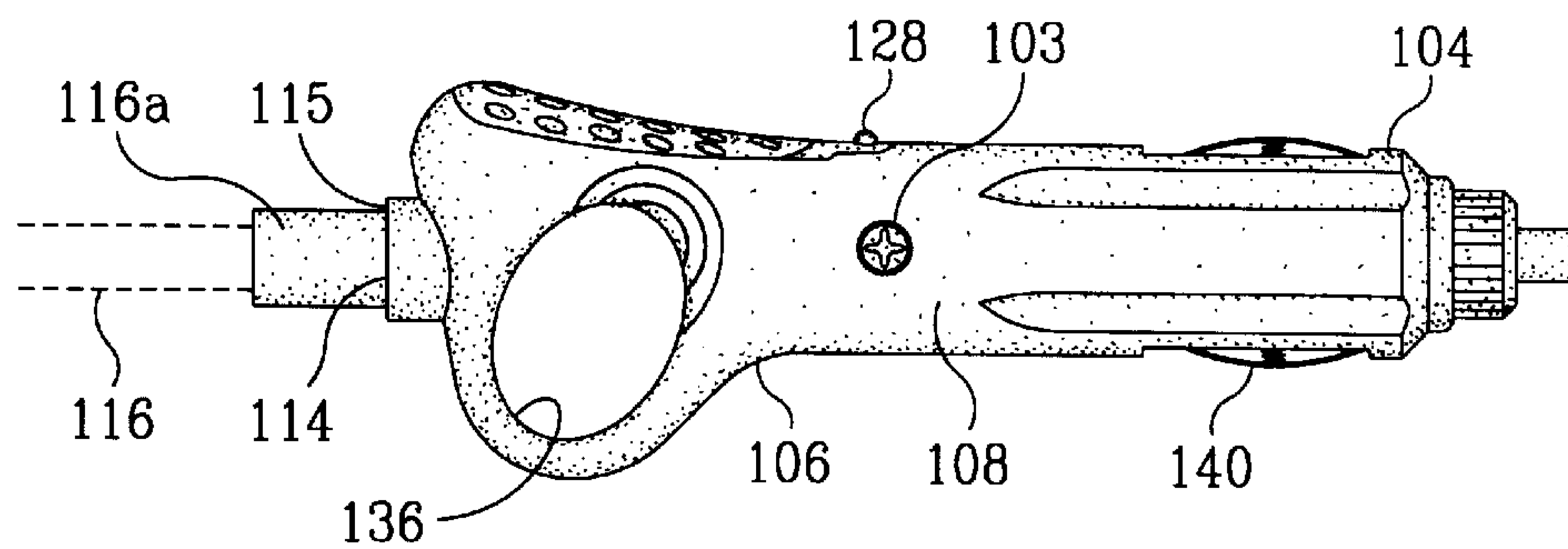


Fig. 3

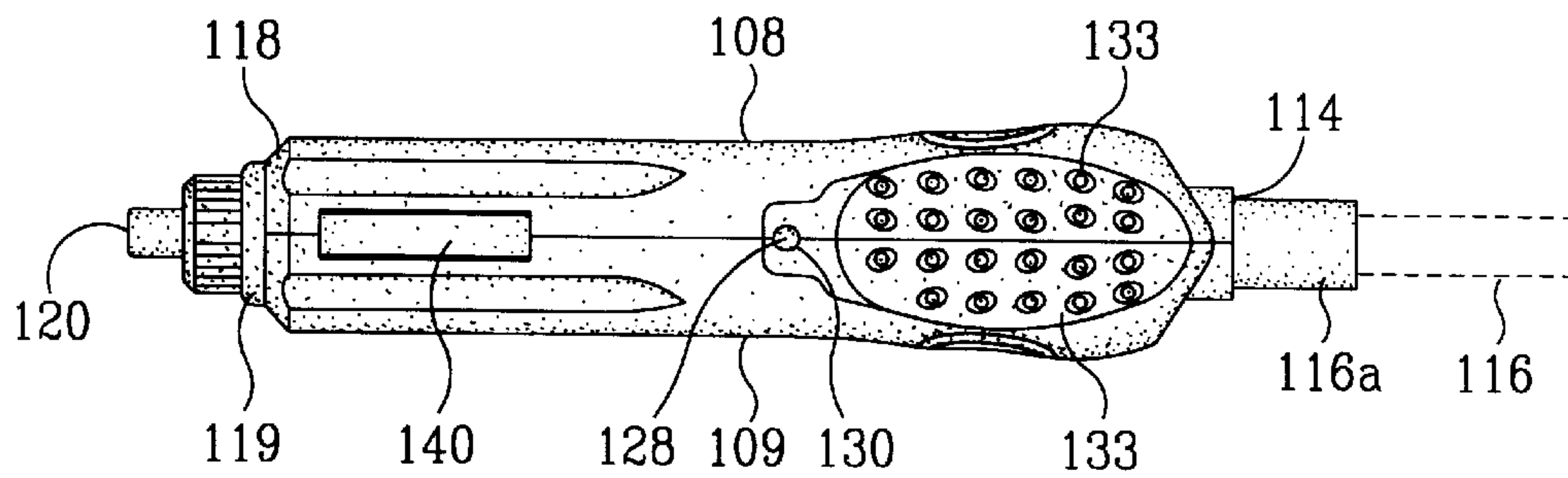


Fig. 4

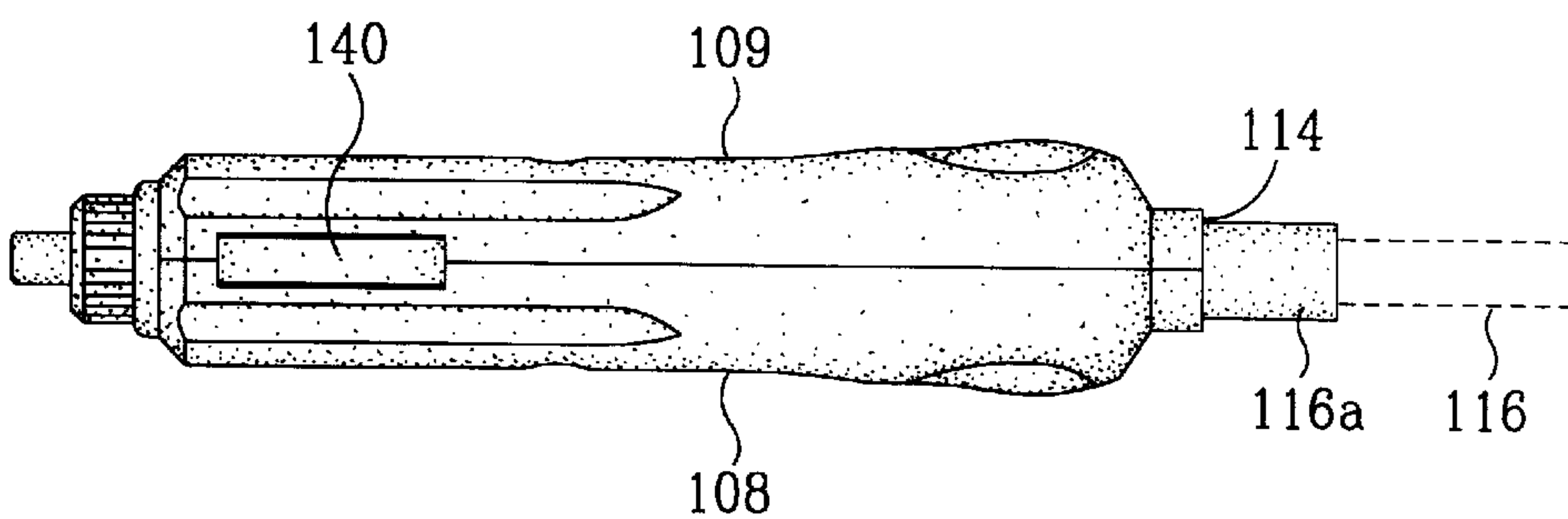


Fig. 5

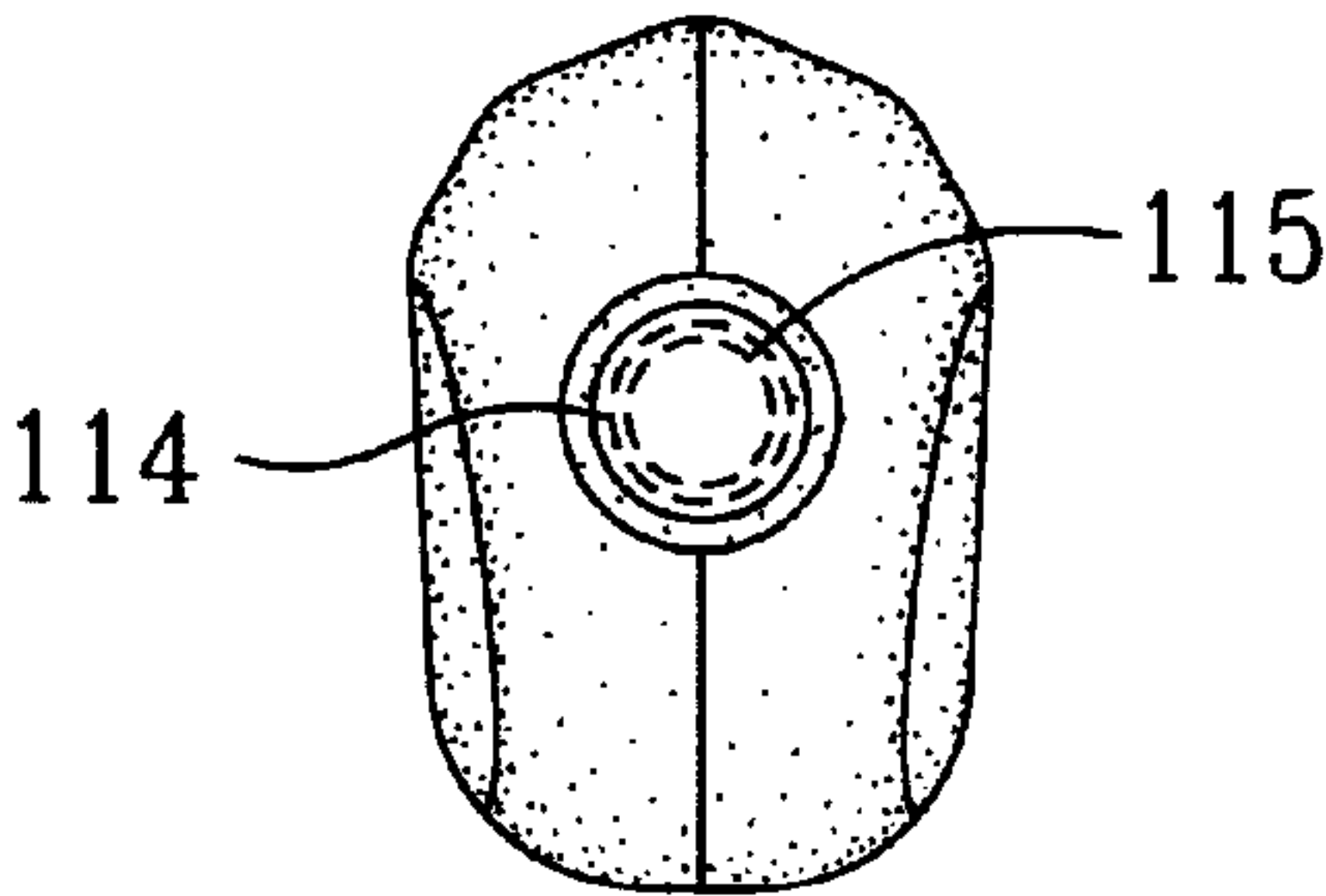


Fig. 6

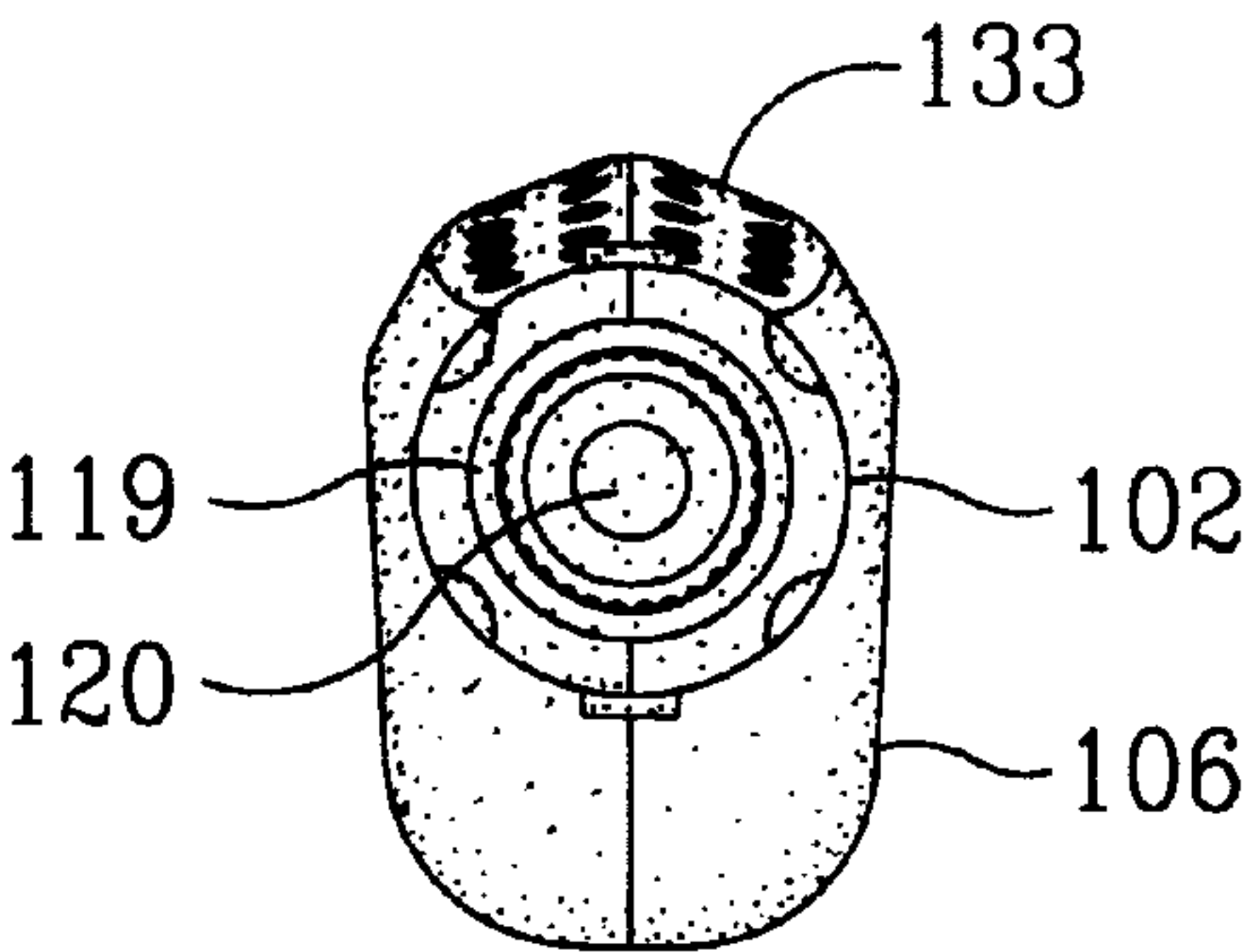
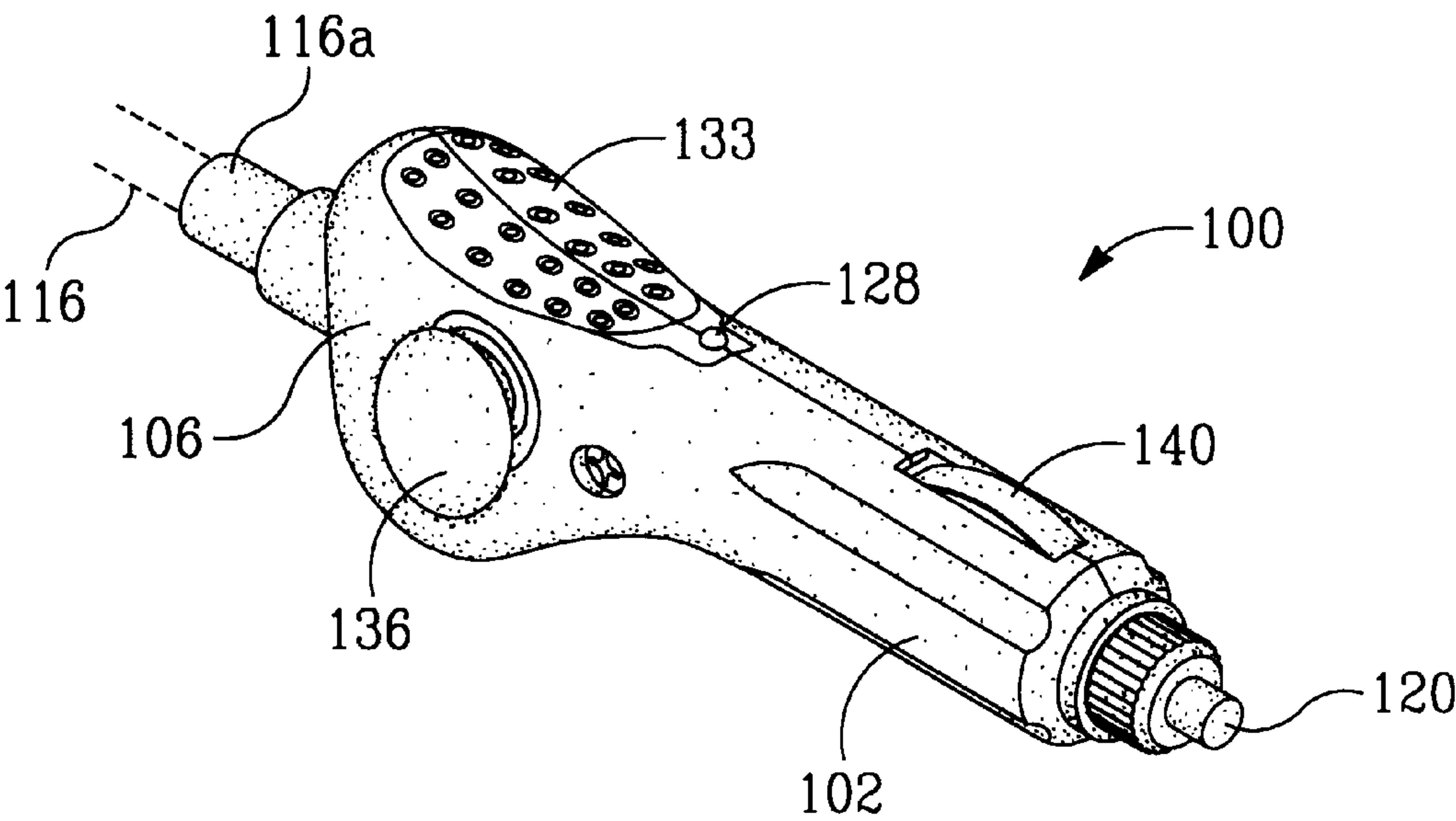


Fig. 7



CIGARETTE LIGHTER ADAPTER WITH GRIPPING STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to cigarette lighter adapters for a cellular telephone or the like, and more particularly to adapters that adapt electrical components for use in a vehicle.

2. Description of Related Art

Cellular telephones are extremely popular and are being used by a larger segment of the population hand-held cellular telephones may be used by their owners either in or outside of vehicles. When the telephone is one that is normally carried by the user, an adapter is required to run the telephone off of the vehicle electrical power rather than the telephone battery. The present invention is directed to a cigarette lighter adapter for an electronic device, such as a cellular telephone, featuring finger gripping portions and cord protection means.

The prior art describes a number of adapters that permit operation of various electronic devices from the electrical power source of a vehicle, particularly from the cigarette lighter within a vehicle. These adapters all share certain common components. The present invention is not focused on such common components as it is directed to a cord protection means which has been absent from the prior art, which facilitates a user to remove the adapter from the vehicle cigarette lighter without damage to the adapter cord. Particularly the invention provides a gripping means which protects the cord of the adapter from damage. In prior art without such means, a user could be tempted to remove the adapter from the socket of the cigarette lighter by pulling on the cord, and thereby tension exerted on the cord could be damaging to the internal components of the adapter.

It is an object of the invention to provide an improved gripping means for a cigarette lighter adapter.

A specific feature of the invention to provide a cord protection means for a cigarette lighter adapter.

It is a further object of the invention to provide a cigarette light adapter for a cellular telephone with a separate grip portion that provides a textured surface for a user to grip.

A specific object of the invention is to provide a separate finger gripping portion which a user can grip with a finger and further provide the advantage of protecting the adapter cord from being pulled or damaged.

It is another object of the invention to provide an insulated grip portion adapter.

SUMMARY OF THE INVENTION

The invention is a cigarette lighter adapter having an elongated housing. The housing has a main body portion and a barrel portion, the barrel portion sized to fit snugly within a cigarette lighter socket. The housing has an internal cavity extending through the main body portion and the barrel portion for housing electronic components of the cigarette lighter adapter. A conductive tip contact is disposed on a front end of the barrel portion. Grounding contact members are disposed on opposing sides of the barrel portion. The tip contact and the grounding contact members are operative with the electronic components of the cigarette lighter adapter.

A cord passage is formed in a rear wall of the main body portion through which an electrical cord extends to connect

with the electronic components of the cigarette lighter adapter. A contoured finger gripping hole passes through the main body portion, the finger gripping hole being positioned forward of the cord passage.

The cigarette lighter adapter further includes an exterior gripping area disposed on a top portion of the main body portion of the housing. The improved cigarette lighter adapter exterior gripping portion features a textured surface for gripping by the user and a finger hole for a user's finger to be inserted through to facilitate the insertion and removal of the adapter from a cigarette lighter socket. The textured portion has raised knob-like members for improved gripping contact. The textured portion may be formed integrally with the housing or may be a portion attached to the main body housing. The textured portion may be a rubber-like material for enhanced gripping.

BRIEF DESCRIPTION OF THE DRAWINGS

The above mentioned advantages and objects of the present invention will further become apparent when taken with the detailed description of the invention and with the drawings in which:

FIG. 1 depicts a side elevation view of a cigarette lighter adapter according to the present invention;

FIG. 2 shows an opposite side elevation view of the cigarette lighter adapter of FIG. 1;

FIG. 3 shows the cigarette lighter adapter of FIG. 1 from above, according to the present invention;

FIG. 4 is a bottom view of the cigarette lighter adapter of FIG. 1 according to the invention;

FIG. 5 shows a rear end view of the cigarette lighter adapter according to the present invention;

FIG. 6 shows the opposite forward end view of the cigarette lighter adapter according to the present invention; and

FIG. 7 shows a perspective illustration of the cigarette lighter adapter according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIGS. 1 through 7, a cigarette lighter adapter **100** is shown constructed in accordance with the principles of the present invention. The adapter **100** is insertable into a cigarette lighter socket (not shown) of a vehicle to draw power from the vehicle in order to power an electronic device, such as cellular telephone, spot light, air compressor, etc. The adapter **100** has a plastic housing **102** that encloses the relevant components thereof and may be considered as having two interconnected sections secured together by fastening means **103**. One section includes an elongated, cylindrical barrel portion **104** having a diameter that is dimensioned to be received within the vehicle lighter socket (not shown). The second section is a main body portion **106** that is attached to, but is generally larger than the barrel portion **104**. The main body portion **106** and the barrel portion **104** are hollow so that they cooperatively form an internal cavity of the adapter **100** that houses and encloses the electronic components of the adapter **100**. The barrel and main body portions **104** & **106** of the adapter **100** may be easily formed from a plastic by a suitable process such as injection molding.

The adapter housing **102** may be formed by molding two opposing halves **108**, **109** that engage with each other. As an alternative to the fastening means **103**, one such opposing half may include recessed female receptacles (not shown)

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formed in boss sections of the housing. These receptacles receive male pins (not shown) that project from the other housing half **108** and the engagement between the two housing halves **108, 109** is in the manner of a press-fit engagement as would be understood by those skilled in the art. An interior lip (not shown) may be provided along the interior edges of the housing half **109** and this lip may be received in a corresponding recess of the other housing half **108**.

Each housing half **108, 109** includes a passage **114** formed in the rear wall **115** thereof through which an electrical cord **116** extends for connection to the electronic device (not shown).

Preferably, a strain relief member **116a** is provided at the interface of the electrical cord **116** and the passage **114**. At the forward end **118**, each housing half **108, 109** includes a similar cylindrical passage **119** formed therein which accommodates a cylindrical conductive tip contact **120**. This tip contact engages, as is known in the art, a “hot” contact of the vehicle electrical system that is typically disposed at the center and end portion of the cigarette lighter socket (not shown). This tip contact **120** is electrically connected in a conventional manner to one or more “hot” or “live” circuits disposed on an internal circuit board. This connection is typically made by a conductive spring (not shown) that biases the tip contact **120** forwardly within the housing end passage **119**. The spring is connected to the circuit board in a suitable manner such as soldering. The circuits disposed on the circuit board may include a transformer circuit that either steps the voltage of the vehicle electrical system up or down to a level appropriate to run a specific electronic device, a charging circuit for charging the electronic device during operation, or even merely a circuit that provides a simple electrical connection between the vehicle and the electronic device. As such, the circuits may include electrical components such as capacitors and resistors as well as integrated circuits in the form of chips. The aforementioned electrical connections and components internal to the cigarette lighter adapter will be understood by those skilled in the art and further discussion thereof as such is unnecessary.

As part of the internal circuitry (not shown) of the adapter **100**, an indicator, such as a light-emitting diode (“LED”) **128** may be provided and positioned within an opening **130** of the housing **102**. This LED **128** indicates to the user that the adapter **100** is operational and a connection has been established with the vehicle electrical system through the lighter socket **102**.

To facilitate the gripping thereof by a user when either inserting or removing the adapter **100** from the cigarette lighter socket **101**, a top portion **132** of the main body **106** may include textured portions **133** on opposite extents of the top portion **132**. These portions **133** may include a plurality of raised knob-like members **134** or any other similar pattern. These textured portion are preferably integral with the housing halves **108, 109**, and may be formed as an integral part of the housing during the aforementioned injection molding.

As described previously, the adapter includes an exterior grip portion **132, 133**. This grip portion may be alternatively formed from a resilient material, such as an elastomer or soft plastic to provide an enhanced gripping surface. The textured pattern may be attached thereon after the construction of the housing halves **108, 109** by suitable means. The soft plastic grip portion also provides a measure of heat insulation to the adapter. It will be understood that the elastomer covering is not limited to only the top portion of the gripping area.

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The top portion **132** may be formed from a flexible or resilient material, such as rubber, an elastomer or a soft plastic, which covers the top portion **132** of the gripping area of the cigarette lighter adapter. The circuitry of the adapter **100** inevitably produces heat during operation and in this regard, thus the rubber covered area **132** provides an insulating layer for the adapter **100**. The textured portions **133** provide an exterior surface that may be reliably gripped by the user regardless of the surrounding temperature.

In an important aspect of the invention, the adapter **100** includes a contoured finger gripping hole **136** through which a user can insert a finger to securely get hold of the rear portion of the adapter **100**. When a user inserts a forefinger through the finger gripping hole **136**, the user’s thumb becomes positioned on the top portion **132** on the textured area **133** of the adapter **100**. The textured portion **133** acts mainly as a thumb grip. When gripped using the finger hole **136** and the textured area **133**, the adapter may be gripped firmly and easily pulled from the cigarette lighter socket without any tension to the cord **116**. These features of the invention protect the adapter cord **116** from damage and prolong the life of the cigarette lighter adapter.

The adapter **100** includes a pair of contact members **140** that provide a ground path or contact between a ground of the adapter circuitry and a ground of the vehicle electrical system. The vehicle system ground typically includes the interior walls **141** of the cigarette lighter socket **101**.

Having thus described various exemplary embodiments of the invention, it will be understood by those skilled in the art that modifications or changes in details of the invention may be implemented without departing from the spirit and scope of the invention as defined in the following claims.

What is claimed is:

1. A cigarette lighter adapter comprising:

- an elongated housing defining an elongated axis, the housing having a main body portion and a barrel portion, said barrel portion sized to fit snugly within a cigarette lighter socket, the housing having an internal cavity extending through said main body portion and said barrel portion for housing electronic components of the cigarette lighter adapter;
- a conductive tip contact disposed on a front end of said barrel portion and grounding contact members disposed on opposing sides of said barrel portion, said tip contact and said grounding contact members operative with the electronic components of said cigarette lighter adapter;
- a cord passage formed in a rear wall of said main body portion through which an electrical cord extends to connect with the electronic components of the cigarette lighter adapter;
- a finger receiving surface disposed on an external surface of said main portion and
- a finger gripping hole passing through said main body portion, said finger gripping hole positioned forward of said cord passage and offset from said longitudinal axis, wherein said finger receiving surface is disposed opposite said finger gripping hole with respect to said longitudinal axis, said finger gripping hole and said finger receiving surface defining a substantially pistol-grip arrangement whereby the finger gripping hole is disposed to receive a user’s index finger and said finger receiving surface is disposed to receive said user’s thumb.

2. The cigarette lighter adapter according to claim 1, wherein said finger receiving surface includes a textured portion.

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3. The cigarette lighter adapter according to claim 2, wherein said textured portion comprises raised knob-like members.

4. A cigarette lighter adapter comprising,

an elongated housing, the housing having a main body portion and a barrel portion, said barrel portion sized to fit snugly within a cigarette lighter socket, the housing having an internal cavity extending through said main body portion and said barrel portion for housing electronic components of the cigarette lighter adapter;

a conductive tip contact disposed on a front end of said barrel portion and grounding contact members disposed on opposing sides of said barrel portion, said tip contact and said grounding contact members operative with the electronic components of said cigarette lighter adapter;

a cord passage formed in a rear wall of said main body portion through which an electrical cord extends to connect with the electronic components of the cigarette lighter adapter; and

a finger gripping hole passing through said main body portion, said finger gripping hole positioned forward of said cord passage

a gripping area disposed on a top portion of said main body portion of said housing: said gripping area including a textured portion having raised knob-like members,

wherein said textured portion is attached to said main body housing and said textured portion comprises a rubber-like material for enhanced gripping.

5. A cigarette lighter adapter, comprising:

an elongated housing defining an elongated axis, the housing having a main body portion and a barrel

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portion, said barrel portion sized to fit snugly within a cigarette lighter socket, the housing having an internal cavity extending through said main body portion and said barrel portion;

electronic components contained within said internal cavity of said housing;

a conductive tip contact disposed on a front end of said barrel portion;

grounding contact members disposed on opposing sides of said barrel portion, said tip contact and said grounding contact members connected to and operative with said electronic components of said cigarette lighter adapter;

a cord passage formed in a rear wall of said main body portion;

an electrical cord extending through said cord passage and connected with said electronic components of the cigarette lighter adapter; and

a finger receiving surface disposed on an external surface of said main portion and

a finger gripping hole passing through said main body portion, said finger gripping hole positioned forward of said cord passage and offset from said longitudinal axis, wherein said finger receiving surface is disposed opposite said finger gripping hole with respect to said longitudinal axis, said finger gripping hole and said finger receiving surface defining a substantially pistol-grip arrangement whereby the finger gripping hole is disposed to receive a user's index finger and said finger receiving surface is disposed to receive said user's thumb.

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